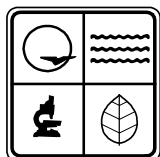


Preventing Pollution in Flexographic Printing

A Guide to Environmental Compliance and
Pollution Prevention for Flexographers
in Missouri



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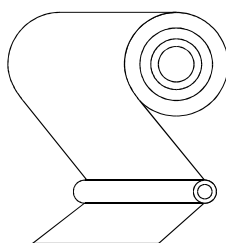


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The information in this publication is intended as general guidance only. For specific requirements, the reader should consult the appropriate federal and state laws and rules.

Funding for development of this document was provided in part by a Pollution Prevention Incentives for States grant from the United States Environmental Protection Agency (EPA).

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PREVENTING POLLUTION IN FLEXOGRAPHIC PRINTING

- Guide Sheet #1

As environmental protection becomes more and more important across the nation, industries of every type are faced with some big questions --

What environmental regulations apply to me and my facility?

How do I comply with those regulations?

Are there things I can do to reduce the regulations I must meet?

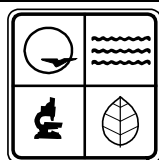
How can I protect myself from fines and liability?

How do I protect myself and my workers from environmental hazards at work?

This publication can help flexographers in Missouri answer some of those questions. The guides provide basic information about regulatory requirements and suggestions for protecting yourself, your workers and the environment through pollution prevention.

Each guide sheet in this publication deals with an issue that you may face in your flexographic printing business. The guides will not answer every question you have. After reviewing them you should be able to decide if you need more information or assistance on a particular issue. The topics are listed on the back of this page. If you do photoprocessing at your business, call (800) 361-4827 to get a free copy of *Preventing Pollution in Photoprocessing*.

The Missouri Department of Natural Resources has a Technical Assistance Program (TAP) to help people comply with environmental regulations and find ways to prevent pollution. If you need assistance, call TAP at (800) 361-4827.



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Guide Sheets for the Flexographic Printing Industry

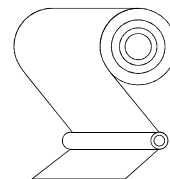
Guide Sheet #2, *Pollution Prevention*
Guide Sheet #3, *Aerosol Cans*
Guide Sheet #4, *Air Quality*
Guide Sheet #5, *Air Quality MACT Standards*
Guide Sheet #6, *Backflow Prevention*
Guide Sheet #7, *Coatings*
Guide Sheet #8, *EPCRA and Form R Reporting*
Guide Sheet #9, *EPCRA and Tier II Reporting*
Guide Sheet #10, *Floor Cleaning*
Guide Sheet #11, *Fluorescent Bulbs*
Guide Sheet #12, *Hazardous Waste*
Guide Sheet #13, *Hazardous Waste Management*
Guide Sheet #14, *Ink Waste*
Guide Sheet #15, *Parts Washers*
Guide Sheet #16, *Plate Disposal*
Guide Sheet #17, *Press Cleaning*
Guide Sheet #18, *Shop Towels*
Guide Sheet #19, *Solvents*
Guide Sheet #20, *Solvent Disposal*
Guide Sheet #21, *Solvent Recycling*
Guide Sheet #22, *Solvent Reuse*
Guide Sheet #23, *Storm Water Permits*
Guide Sheet #24, *VOCs and HAPs*
Guide Sheet #25, *Wastewater*
Guide Sheet #26, *Contact List*

If you have comments or suggestions for ways to improve these guide sheets, please let us know by calling TAP at (800) 361-4827.

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Preventing Pollution in Flexographic Printing - Guide Sheet #2

POLLUTION PREVENTION



Flexographic printing facilities deal with many things that can affect the environment.

Materials such as ink and solvents can harm the environment and people if they are not properly managed. State and federal environmental regulations explain what legally can and cannot be done with these materials. The regulations describe how pollution (waste) should be controlled, stored, treated or disposed. A better solution is to prevent the waste or pollution.

What is Pollution Prevention?

Pollution prevention is simply not making the waste or pollutant in the first place. It means doing what we can to reduce the amount and toxicity of the pollution we generate.

Preventing pollution may be something as simple as using a catch-basin to prevent spills, or something as complex as redesigning your operation to increase efficiency and reduce waste. Simple things such as choosing nonhazardous solvents can protect the environment and reduce the number of environmental regulations you face.

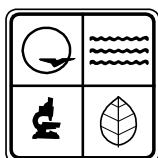
Pollution prevention means thinking about the environmental impact of your actions and trying to limit that impact.

Why Prevent Pollution?

When we generate waste or pollution, we must safely and legally manage that waste or pollution. Whether it is household trash or waste from a business, managing wastes costs money. And usually the things we discard are materials we paid for when we got them. A good example is paper towels. We buy them, use them once, then pay again to have them disposed.

If we reduce the amount of waste we generate, we save money. It's as simple as that. Reducing costs is a major reason to prevent pollution. Here are a few others:

- ✓ Improved work environment and worker safety.
- ✓ Reduced liability.
- ✓ Increased efficiency.
- ✓ Fewer regulatory requirements.
- ✓ Better environmental protection.
- ✓ Enhanced marketing and public relations opportunities.



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What Can Be Done at Flexographic Printing Facilities?

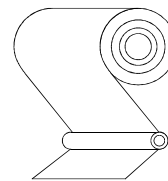
There are many ways to prevent pollution at flexographic printing facilities. Each of these guide sheets has suggestions on ways to prevent pollution. Here are a few general tips:

- ✓ Keep work areas clean and well organized to help prevent accidents.
- ✓ Use drip pans and splash guards where spills frequently occur.
- ✓ Fix leaks immediately.
- ✓ Don't buy more than you need. The leftovers may become waste.
- ✓ Purchase the largest practical container (containers usually end up as waste), but don't buy more than you need.
- ✓ Purchase the least toxic or hazardous product available. Check the material safety data sheets for products you purchase. If the product is toxic or hazardous, ask your supplier for alternatives.
- ✓ Use the oldest items first (first-in, first-out).
- ✓ If you do have excess or unneeded materials, see if your supplier can take them back.
- ✓ Include the cost of disposal when you make purchasing decisions. What looks like the cheapest option may cost more because of disposal or other management costs.
- ✓ Store materials in a way that keeps them from being damaged.
- ✓ Inspect storage areas regularly for leaks.
- ✓ Make sure all items are clearly labeled. Store products in original containers.
- ✓ Store wastes separately and be sure they are properly labeled to make it easier to reuse or recycle them.
- ✓ Store items that could leak in a place where leaks will be contained and easily spotted.
- ✓ Make a list of your wastes, then try to find a way to eliminate each of them. For example, if you throw away paper towels consider using launderable shop rags instead.

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Preventing Pollution in Flexographic Printing - Guide Sheet #3

AEROSOL CANS



Flexographic printers use aerosol cans for various reasons. Spray cans may contain hazardous chemicals, such as xylene or toluene. In some cases, the aerosol can may be hazardous waste because of what it contains or did contain. It is important to carefully manage this waste to protect human health and the environment.

Aerosol cans are often recycled as scrap metal. If the empty cans are recycled, the can and the residue in it are not considered waste so most hazardous waste regulations don't apply. If the can is not empty, it can still be recycled if the recycler is able to properly capture and manage the vented contents. However, if the aerosol can contained an acutely hazardous waste such as some pesticides, it is unlikely that the recycler is able to properly clean the container. These containers will probably

require disposal. See guide sheet #12, *Hazardous Waste*, for more information on acutely hazardous waste.

If your aerosol cans are empty, you can recycle them or send them to a sanitary landfill for disposal.

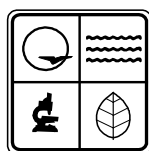
If you have one or two waste aerosol cans infrequently, you can send them to a sanitary landfill for disposal (even if they are not empty) if the landfill is willing to accept them. If you generate more cans than that, you need to find out if the waste you have is a hazardous waste and manage the waste properly. See guide sheet #12, *Hazardous Waste*, for more information.

Ask your supplier to take back any defective cans. The manufacturer can sometimes repack the materials.

REMEMBER

Aerosol cans can be hazardous waste. You need to find out if your waste is hazardous and manage it properly.

Empty cans — and sometimes cans that aren't empty — can be recycled. Sometimes the contents can be reused.



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POLLUTION PREVENTION

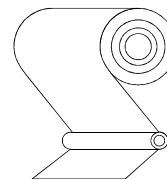
Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

- √ Decide if you actually need these products. If not, use up what you have and don't purchase any more. If you do need these products, limit their use and look for aerosol cans that do not contain hazardous chemicals.
- √ Switch to non-aerosol products if possible, such as manual pump cans or bottles. Some containers may be refillable.
- √ Use as much as possible of the material for its intended purpose.
- √ Purchase only the amount you need.
- √ Follow label directions to prevent clogging.
- √ If your aerosol cans contain hazardous materials, look for nonhazardous alternatives.

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Preventing Pollution in Flexographic Printing - Guide Sheet #4

AIR QUALITY



Some inks and solvents used by printers contain air pollutants called Volatile Organic Compounds (VOCs). These chemicals help create smog. Many solvents are also Hazardous Air Pollutants (HAPs). These chemicals can harm human health. See guide sheet #25, *VOCs and HAPs*, for more information about these chemicals.

To protect air quality and human health, federal, state and some local governments have rules to control air pollution. You need to find out what rules apply to your facility.

The Technical Assistance Program (TAP) can help you decide what rules apply to you, send you the needed forms and help you fill them out. Call TAP at (800) 361-4827.

The three major issues affecting you are

- ✓ Emissions Inventory Questionnaire
- ✓ Operating Permit
- ✓ Construction Permit
- ✓ State rule in non-attainment areas

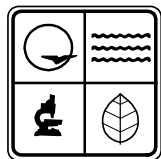
Emissions Inventory Questionnaire (EIQ). An EIQ is a form that asks about the equipment you have and the chemicals you use. The information is needed to find out what you must do to protect the air quality in your area. The EIQ is used to calculate the amount of air emissions your shop could

have if it operated at full capacity. This is called potential emissions. It is also used to find out your actual emissions. You need to complete an EIQ to find out if you need an operating permit or construction permit. The EIQ is also used by the Missouri Department of Natural Resources to keep track of air emissions throughout the state.

On the EIQ you will need to describe how jobs flow through your shop and what equipment you have. You will need to include the type and capacity of each press, parts washer and any other equipment that uses solvent-based ink or solvents. You also will need information from your material safety data sheets (MSDS).

Some businesses need to complete an EIQ every year and pay a fee for their air emissions. Smaller operations may need to submit one every five years. After you send in an EIQ, you will be told whether you need to submit EIQs in the future. If you make changes in your operation, such as switching solvents or inks, be sure these changes are reflected in your next EIQ.

Consider using low-VOC inks and solvents to reduce your potential and actual air emissions. Also, try to avoid using solvents that are HAPs.



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Operating Permit

Facilities that could emit large amounts of air pollutants must get an operating permit under the Missouri Air Conservation Law. You need an operating permit if your facility has large potential emissions.

Most small flexographic shops will not need an operating permit. For help finding out if you need an operating permit, contact TAP or another environmental professional.

Construction Permit

You may need a construction permit before building a new shop or making changes to your existing shop. Adding or changing printing lines, adding on to your building or adding a parts washer are examples of changes that may require a construction permit.

If your shop started construction after May 13, 1982, or if you have made equipment changes since that date, it's possible that you should have had a construction permit. If that's the case, you still need the permit even if the construction is finished.

Contact TAP or another environmental professional for help deciding if you need a construction permit.

REMEMBER

If you use solvent-based inks or cleaners, you need to complete an EIQ. You may need an operating permit. If you make changes at your shop, you may need a construction permit.

Use low-VOC inks and cleaners. Avoid using solvents that are HAPs.

Keep in mind that even if you don't need an operating permit now, changes at your shop may increase your potential emissions and cause you to need a permit. It is wise to check with TAP or another environmental professional before you make any changes that could increase your potential air emissions.

Local Requirements

Some areas in Missouri have local air quality requirements. If your facility is in St. Louis, St. Louis County, Kansas City or Springfield, the local agency will issue permits. These contacts are

City of St. Louis

Division of Air Pollution Control
(314) 664-7877

St. Louis County

St. Louis County Department of Health
(314) 854-6293

Kansas City

Kansas City Health Department
(816) 983-4475

Springfield

Air Pollution Control Authority
(417) 864-1662

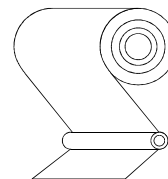
Elsewhere in Missouri

Missouri Department of Natural Resources
Air Pollution Control Program
(573) 751-4817

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Preventing Pollution in Flexographic Printing - Guide Sheet #5

AIR QUALITY "MACT" STANDARDS



Note: The federal requirements for printing and publishing industry can be found in the *Code of Federal Regulations*, Title 40, Part 63, subpart KK (40 CFR 63).

Federal regulations set air emission standards called the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) and the Maximum Achievable Control Technology (MACT) that apply to specific industries. These rules may apply to your flexographic printing business if

- ✓ Your press(es) can print on substrates over 18 inches wide and
- ✓ Your business is a "major source" or "area source" of hazardous air pollutants (HAPs).

Major Source. To decide if you are a major source you need to find out what HAPs you use. The U.S. Environmental Protection Agency (EPA) publishes a list of chemicals classified as HAPs. The manufacturer should give you a Certified Product Data Sheet (CPDS) that contains information about HAPs in the products you use. Guide sheet #24, *VOCs and HAPs*, lists some of the HAPs most commonly used in flexography.

The other information you need is your potential to emit (PTE). The PTE is the

amount of air emissions that would come from your business if it operated 24 hours each day, 365 days a year at its highest hourly capacity. Information from your Emissions Inventory Questionnaire will help you figure out your PTE.

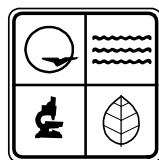
A major source is a business that has a PTE of 10 tons or more of any listed HAP per year or 25 tons or more of any combination of HAPs.

Area Source. If you have a PTE over the major source levels, you can choose to be classified as an area source by limiting the amount of HAPs you use. Area sources have to meet annual HAP limits, but do not need to meet major source emission limits.

To be considered an area source you must

- ✓ Use less than 10 tons of each HAP and less than 25 tons of any combination of HAPs for 12 consecutive months or
- ✓ Emit less than 10 tons of each HAP and less than 25 tons of any combination of HAPs for 12 consecutive months.

Compliance Dates. Since May 30, 1996, new sources have been required to meet these requirements. Existing sources must meet the requirements on and after May 30, 1999.



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Emission Limits. If you are a major source, you must

- ✓ Control 95 percent of all organic HAP emissions, as applied on a monthly basis, or
- ✓ Show that no more than 4 percent of the total mass of inks and other materials applied for the month are HAP emissions, or
- ✓ Show that HAP emissions do not account for more than 20 percent of the total mass of solids applied for the month.

See the federal regulations for a complete set of the requirements. Emission limits are discussed in 40 CFR Part 63.825(b).

Reporting. The initial notification report was due May 30, 1998, for existing major sources and existing area sources. New sources must notify within 120 calendar days after start up. However, if your new source needs a construction or operating permit you must submit your initial notification before you begin construction.

You must submit the following information:

- ✓ The name and address of the owner or operator.
- ✓ The physical location/address of the source.
- ✓ An identification of what standard(s) apply and applicable compliance dates.

REMEMBER

If your press can print on substrates over 18 inches wide, you may be subject to MACT standards.

Low-VOC, HAP-free inks and cleaners can help you meet these standards.

- ✓ A brief description of the nature, size, design and method of operation of the source, including its operating design capacity and identification of each point where a HAP is or is expected to be emitted.

Contact the Missouri Department of Natural Resources for an initial notification form. On the notification you will state that you are a "subpart KK" source. This refers to the section of the regulations containing these requirements. You will also need to state that you are a major source or area source.

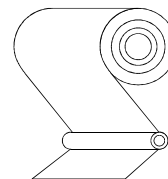
Major sources that will use control devices must determine the destruction efficiency and capture efficiency of the device with a performance test. The notification of a performance test is required in writing at least 60 days before the test and must be witnessed by a qualified state or federal observer.

Recordkeeping. If you are a major or area source, you must maintain records, measurements and calculations to show that you meet the regulations. You also must maintain records of operating parameter data for the air pollution control equipment along with all maintenance performed on the control equipment.

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Preventing Pollution in Flexographic Printing - Guide Sheet #6

BACKFLOW PREVENTION



Whether your business uses water from the public water supply or you have a private water supply such as your own well, it is important that you avoid contaminating that water. In some situations, water and any contaminants it contains can flow backwards in a water line. This can contaminate the water in your building and even the entire water supply. Backflow prevention devices prevent this problem.

If you have places where the water line comes into direct contact with a potential contaminant, the contaminant can travel back into the water line when there is a change in pressure. This is called a cross-connection. For example, if process water from your platemaking process flowed back into your water system, your entire water system could be contaminated with process chemicals.

Backflow prevention devices or assemblies are installed in water lines to keep this from happening. They are placed in water lines entering the building and at points in the water system where it connects to a potential source of contamination.

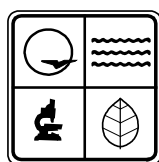
If your business is connected to a public water supply, state regulations require that you protect the public water supply from cross-connections within your premises. If your operation could cause contamination to the water supply, you must have backflow prevention.

Drinking water regulations require that the backflow prevention assembly be placed on the water service line. It is a good idea to put additional backflow preventers at any location in your business where contamination could occur.

Your local water supplier may have additional requirements regarding backflow prevention. Contact that office to find out.

Even if your business is not connected to a public water supply, you should install backflow prevention devices to protect you, your employees and your customers from the risk of contaminated drinking water and to prevent pollution.

The Missouri Department of Natural Resources maintains a list of approved backflow prevention assemblies. To get a copy, call (800) 361-4827.



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REMEMBER

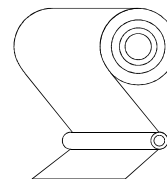
Preventing backflow into the water system protects you and anyone using your water supply.

If you are connected to a public water supply system, you may be required to have backflow prevention assemblies or devices.

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Preventing Pollution in Flexographic Printing - Guide Sheet #7

COATINGS



Some print jobs require that some type of coating be used on the printed material. Depending on the type of overprint coating, these materials can be significant sources of air pollution and hazardous waste at your print shop.

Environmental Concerns

The major environmental issues associated with coatings are

✓ **Air quality:** Many coatings contain volatile organic compounds (VOCs) or hazardous air pollutants (HAPs). These air pollutants can harm human health and the environment. Businesses with large VOC or HAP emissions are strictly regulated. See guide sheets #4, *Air Quality Permits*, and #24, *VOCs and HAPs*. Always look for low-VOC, HAP-free materials.

✓ **Hazardous Waste:** Coatings may be regulated as hazardous waste, usually because they have hazardous characteristics. A waste that has a flash point of less than 140° F is an ignitable hazardous waste. That means it will burst into flames at temperatures below 140° F. Corrosive hazardous wastes have a pH of 2 or lower or a pH of 12.5 or higher. Reactive hazardous wastes are

wastes that are normally unstable, react violently with water, can explode or release poisonous gases.

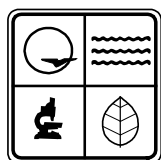
Always ask your supplier if the material you are buying is regulated as hazardous waste. If it is, ask for a nonhazardous alternative. See guide sheet #12, *Hazardous Waste*, for more information.

✓ **Solid Waste:** Solid wastes are those that can go in your regular trash. You should always try to reduce the amount of solid waste generated. Consider recycling the wastes you do have.

Coating Types

The most common types of coatings are listed here with comments about environmental concerns. Discuss these issues with your customers so they can consider them when making purchasing decisions. Many businesses successfully use environmental issues in their marketing strategies, selling environmentally preferable goods and services.

✓ **Varnishes:** Overprint varnishes usually contain a high percentage of volatile organic compounds (VOCs). Waste varnish may also be regulated as hazardous waste.



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✓ Ultraviolet (UV) and Electron Beam (EB) Coatings: Using UV or EB coatings does not usually generate air pollution or hazardous waste. However, there are significant issues related to employee safety when using and storing these chemicals. There is also a risk of excess waste because old product becomes unusable and because the chemicals can react unintentionally, becoming solid waste.

✓ Aqueous Coatings: Aqueous, or water-based, coatings generally have minimal environmental impact. Papers coated with water-based lacquer coatings can be recycled and re-pulped. Catalytic cured aqueous coatings can generate formaldehyde.

✓ Lamination: Solvent-based laminates release VOCs. These coatings also make paper difficult to recycle.

REMEMBER

Coatings may contain air pollutants, may be hazardous waste and may raise issues of employee safety. Find out how your coatings are regulated and the rules that apply.

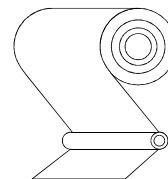
POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ Work with suppliers to find nonhazardous coatings with little or no VOCs and no HAPs.
- ✓ Educate customers about environmentally preferable coatings. Customers often are willing to consider environmental issues in their decision-making. Consider including environmental issues in your marketing strategy.
- ✓ Consider the entire cost of the product you are purchasing. Indirect costs such as hazardous waste fees, time spent completing regulatory paperwork, use of personal protective equipment, waste disposal costs, cost of permitting, etc. should be considered along with the purchase price of any product.

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EPCRA and FORM R REPORTING



Most flexographers use chemicals that can pose a serious risk to human health and the environment, particularly in the event of a fire, flood or other emergency. If you use large amounts of these chemicals, you may need to complete a report called a Form R.

In 1986, the federal government passed the Emergency Planning and Community Right-to-Know Act (EPCRA), sometimes called SARA Title III. Missouri also has its own Community Right-to-Know Law. These laws require states, communities and businesses to work together on emergency plans for accidental chemical releases, emergency notification procedures, toxic emissions reporting and compiling an inventory of hazardous chemicals for planning and public review.

Under EPCRA, some printers need to complete a form called a Form R each year. This form is part of the Toxic Release Inventory (TRI) which is a way for businesses to share information with the public about the chemicals they use. Many businesses have found that completing a Form R has helped them find ways to be more efficient and reduce waste.

As a printer, you need to complete a Form R if you have 10 or more full time employees

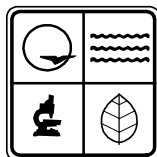
or full time equivalents, and

- ✓ You manufacture or process more than 25,000 pounds per year of a chemical on the TRI list, or
- ✓ You use (in some other way) more than 10,000 pounds per year of a chemical on the TRI list.

If you use chemicals in these quantities, you need to find out if they are on the TRI list. Your supplier should be able to tell you whether a chemical you purchase is a TRI chemical. The material safety data sheet (MSDS) may have this information.

To get a copy of the list of TRI chemicals, contact the Missouri Department of Natural Resources (DNR) at (800) 361-4827. The table on the back of this page lists some of the TRI chemicals commonly reported by printers. Remember, this is just part of the list. If you use chemicals in large amounts, check with your supplier or check the entire list to find out if they are subject to TRI reporting.

On the Form R, you will need to report the quantity of each TRI chemical you release to the environment or send off-site for treatment or disposal. The form must be completed each year by July 1.



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If you find that you should have been completing Form R's in the past, you will need to complete a form for each year that you should have filed (back through 1987) and submit it as soon as possible.

If you need a Form R and instructions, contact DNR at (800) 361-4827. If you need help deciding whether you must complete a Form R or if you need help completing the form, contact DNR or another environmental professional.

TRI Chemicals Commonly Reported by Printers*

Toluene
Methanol
Methyl ethyl ketone
Glycol ethers
Formaldehyde
Phenol
Dichloromethane
Xylene
Ethylene glycol
Methyl isobutyl ketone

*This is not a complete list of TRI chemicals.
Contact DNR for more information.

REMEMBER

You need to complete a Form R if you have 10 or more full time equivalent employees AND you process or manufacture over 25,000 pounds or otherwise use over 10,000 pounds of a TRI-listed chemical in one calendar year.

If you didn't submit a Form R and learn that you should have, you need to submit it as soon as possible.

POLLUTION PREVENTION

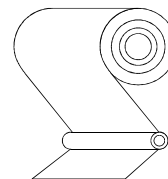
Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Many companies have found that completing a Form R has led to increased efficiency and better operations. You can use the Form R to

- √ Find out how much of your purchased material is becoming waste.
- √ Identify priorities for pollution prevention projects.
- √ Measure progress toward reducing releases.

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Preventing Pollution in Flexographic Printing - Guide Sheet #9

EPCRA and TIER II REPORTING



Most flexographers use chemicals that can pose a serious risk to human health and the environment in the event of a fire, flood or other emergency. Emergency responders are at particular risk if they respond to an emergency where these materials are stored.

In 1986, the federal government passed the Emergency Planning and Community Right-to-Know Act (EPCRA), sometimes called SARA Title III. Missouri also has its own Community Right-to-Know Law. These laws require states, communities and businesses to work together on emergency plans for accidental chemical releases, emergency notification procedures, toxic emissions reporting and compiling an inventory of hazardous chemicals for planning and public review.

Missouri's law requires markings on buildings, rooms and containers where hazardous chemicals are present. Markings are to conform with National Fire Protection Association (NFPA) 704 standard.

In Missouri, EPCRA is administered by both the Missouri Department of Natural Resources (DNR) and the Missouri Department of Public Safety (DPS).

To comply with EPCRA you need to find out if you have a regulated material in a regulated quantity. You can contact either DNR or DPS to get a list of materials regulated under EPCRA. Depending on the type and quantity of material, you may need to

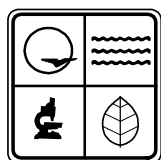
- ✓ Complete a Tier II Form.
- ✓ Designate a facility coordinator to work with the Local Emergency Planning Committee (LEPC).
- ✓ Notify DNR and the National Response Center if you have a release (spill).
- ✓ File a Form R.

Tier II Forms

To get a list of substances that require a Tier II form and the threshold planning quantities, or to get a Tier II form and instructions, contact DPS at (800) 780-1014.

You need to complete a Tier II if you have

- ✓ An extremely hazardous substance over the threshold planning quantity or over 500 pounds, whichever is lower, or
- ✓ More than 10,000 pounds of a hazardous chemical for which an MSDS is required under OSHA's Hazard Communication Standard.



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If you need to submit a Tier II, you also must pay a fee. The fee will typically be \$100, plus \$20 for each reported chemical over three. Most of this money is used to support local efforts to prevent and prepare for chemical hazards and for hazardous materials training.

The Tier II form with the fee is submitted yearly on March 1 to the Missouri Emergency Response Commission (MERC).

You also must send copies of the Tier II form to your LEPC and the appropriate local fire department.

Facility Coordinator

If you have an extremely hazardous substance in amounts over the threshold planning quantity you must choose a person at your facility to work with the LEPC. This person will be the first emergency contact listed in the Tier II form.

REMEMBER

If you have 10,000 pounds of a chemical requiring an MSDS under OSHA hazardous communication standard or if you have over 500 pounds (or the threshold planning quantity) of an extremely hazardous substance you must submit a completed Tier II form to the fire department, the LEPC and the MERC.

Even if you aren't required to file an emergency plan, you should have an emergency plan at your facility and discuss it with your local emergency responders.

Spill Notification

If you have a spill (release) of an extremely hazardous substance or hazardous substance in excess of the reportable quantity, you must call DNR at (573) 634-2436 and call 911 (or the appropriate emergency response number). You also must follow up with a written report to the MERC and LEPC discussing the response measures taken and health information.

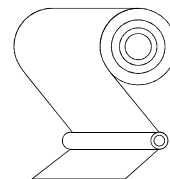
Form R

See guide sheet #8, *EPCRA and Form R Reporting*, for more information on this. You need to complete a Form R if your facility

- ✓ Has an SIC (Standard Industrial Classification) Code that begins with the numbers 20-39,
- ✓ Has more than 10 employees, and
- ✓ Manufactures, processes or otherwise uses certain toxic chemicals in excess of threshold quantities (25,000 or 10,000 pounds).

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FLOOR CLEANING



Floor cleaning at printing shops can have an environmental impact depending on the cleaning methods used. Floor cleaning is also important from a customer relations standpoint.

The most important step in preventing environmental problems from floor cleaning is to prevent spills. Use drip pans to catch fluid spills. Place wastes to be disposed of or recycled in proper containers. If you do have a fluid spill, clean it up immediately with the appropriate absorbents.

The first cleaning step should be to sweep the floor to remove loose, dry materials. If you have allowed hazardous materials to fall on the floor, it is possible that these sweepings could be hazardous waste. For example, inks may contain heavy metals such as chromium. If these sludges are mixed with floor sweepings, the sweepings could be contaminated with chromium.

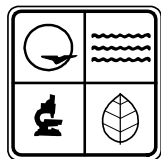
Sweepings that are contaminated with hazardous materials will have to be tested. They will require special management and disposal if they are found to be hazardous. See guide sheet #12, *Hazardous Wastes*, for more information.

When washing the floor, do not use caustic cleansers or solvents that can cause damage to a public sewer and treatment system or to a private septic system. Biodegradable soaps are available and are usually gentler on both these systems. Be particularly cautious if your shop is not connected to a public sewer system. Septic systems can be seriously damaged by some cleaning chemicals and solvents.

If your facility is connected to a public sewer and wastewater treatment system, contact the treatment facility. Tell the facility operators about the materials you handle and ask if they can accept your wastewater. There may be local regulations restricting what you can pour down the drain and discharge into the sewer system.

Do not discharge wash water to the outdoors. If you release wastewater off your property, you could be in violation of Missouri's laws.

Avoid hosing off the floor when dry sweeping is possible. Hosing off the floor uses a great deal of water, creates a greater risk of pollution and is usually not effective for cleaning oils or oil-based inks.



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REMEMBER

If listed hazardous wastes are mixed with floor sweepings, all of the material is hazardous waste.

Contact local sewer plants to find out about local requirements for wastewater discharged to them.

Do not discharge wastewater outdoors.

POLLUTION PREVENTION

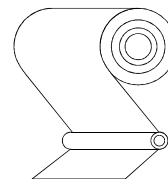
Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

- √ Prevent spills and clean up spills immediately.
- √ Pre-clean the floor with a dry broom.
- √ Use biodegradable soap and water to do final cleaning.

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Preventing Pollution in Flexographic Printing - Guide Sheet #11

FLUORESCENT BULBS



Many people use fluorescent lights. Fluorescent bulbs contain toxic metals such as mercury, cadmium and lead. Unbroken lamps pose no threat to human health and the environment. However, when fluorescent bulbs are broken, people may be exposed to toxic levels of mercury vapor and other metals which can be easily inhaled.

The Missouri Department of Natural Resources (DNR) encourages prudent lamp recycling to safeguard human health and to limit the amounts of toxic heavy metals entering the environment.

If your business generates one or two lamps infrequently, you may dispose of these in a Missouri sanitary landfill. Before disposal, place the lamp into the box the replacement lamp came in, put the box into a plastic bag and secure the bag at the top before placing it into the dumpster. These precautions will help keep the bulb from breaking right away and will help protect you and the trash hauler.

To better protect the environment, DNR encourages you to send your lamps to a certified recycler.

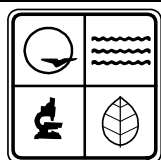
Nonhazardous Lamps

If you know your fluorescent lamps are non-hazardous you may send them to a Missouri sanitary landfill or to a lamp recycler. You should contact the landfill operator for permission before disposal. The landfill operator can refuse to accept the waste. The landfill may require a special waste disposal request before accepting the material.

Lamps Sent for Recycling

Businesses in Missouri may send their **unbroken** lamps to a recycler in Missouri that has resource recovery certification from DNR or to an out-of-state recycler. If unbroken lamps are sent for recycling, you do not need to use a licensed hazardous waste transporter in Missouri. You may use a hazardous waste manifest or other shipping papers to record and track your shipments of unbroken lamps.

If you intend to send hazardous lamps to an out-of-state recycler, you should contact the environmental agencies in the states through which the lamps will travel for their state requirements. Other states may require use of a licensed hazardous waste transporter and a manifest for shipments to a recycler even though Missouri does not.



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Hazardous Lamps

Your fluorescent bulbs are subject to hazardous waste regulations if

- ✓ You deliberately crush them OR
- ✓ They are identified as hazardous **and** are sent to a facility for treatment, storage or disposal. See the guide sheet #12, *Hazardous Waste*, for more information.

There are two ways to determine if lamps are hazardous.

1. Test the waste. The test for determining the toxicity of fluorescent lamps is the Toxicity Characteristic Leaching Procedure (TCLP). If the level of any metal is at or above the acceptable level, the lamps are "hazardous waste." Acceptable levels are published in the *40 Code of Federal Regulations 261.24* as follows:

Mercury - 0.2 milligrams per liter (mg/l)

Cadmium - 1 mg/l

Lead - 5 mg/l

2. Apply knowledge of the hazardous characteristic. Data from lamp manufacturers shows that traditional fluorescent lamps are likely to be hazardous waste. If you wish, you may assume the lamps are hazardous to avoid the costs of testing. However, your disposal firm may require test results before taking your lamps.

The hazardous waste regulations you must meet depend on how much waste you generate. It may be helpful to know that 350 of the standard four-foot long lamps weigh about 220 pounds. If you have over 220 pounds of hazardous waste in a month or at any one time you are regulated as a small quantity generator. See guide sheet #12, *Hazardous Waste*, for more information.

Low-mercury lamps are available. Ask your lamp supplier for information.

REMEMBER

Fluorescent bulbs may be hazardous waste.

If you generate one or two waste fluorescent bulbs infrequently, you may send them to a Missouri sanitary landfill. Contact the landfill first.

Do not break fluorescent bulbs.

POLLUTION PREVENTION

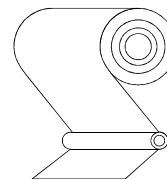
Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ Purchase low-mercury bulbs.
- ✓ Protect bulbs from breakage.
- ✓ Recycle bulbs.

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Preventing Pollution in Flexographic Printing - Guide Sheet #12

HAZARDOUS WASTE



Note: The federal requirements for hazardous waste can be found in the *Code of Federal Regulations*, Title 40, Part 260 through Part 280 (40 CFR 260-280). The Missouri Hazardous Waste Law is in the *Revised Statutes of Missouri* (RSMo), Sections 260.350-260.552. The hazardous waste rules are in the *Code of State Regulations*, Title 10, Division 25 (10 CSR 25). To get information on the regulations, call the Missouri Department of Natural Resources (DNR) at (800) 361-4827 or the federal government's Superfund/RCRA Hotline at (800) 424-9346.

Many printers generate hazardous waste. It is very important that you find out if your wastes are hazardous and that you follow the law when managing the wastes.

What is a Hazardous Waste?

A waste is a material that you no longer use and will discard. It can be a solid, liquid or gas. A waste is hazardous if it has properties that could be dangerous to human health and the environment. Solvents and inks are examples of wastes that could be hazardous.

It is **your** responsibility to find out if your waste is hazardous. A waste is hazardous if

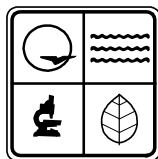
- ✓ It is listed as a hazardous waste in the federal regulations;
 - ✓ It exhibits a hazardous characteristic;
 - ✓ It is a hazardous waste by Missouri law;
- or

- ✓ It is a mixture of a listed hazardous waste and any other waste.

Listed Hazardous Waste – The federal government publishes lists of hazardous wastes. There are four different lists: The F list, the K list, the P list and the U list. Wastes that are on the P list are called "acutely hazardous" and are regulated more strictly than the other types.

Characteristic Hazardous Waste – Some wastes that are not on the lists may still be regulated hazardous wastes because they have characteristics that make them hazardous. There are four characteristics:

- ✓ Ignitable – A waste with a flashpoint of less than 140° F, or solids that catch fire easily and burn so rapidly they create a hazard. Some solvents are ignitable.
- ✓ Corrosive – A waste with a pH less than or equal to 2.0 or greater than or equal to 12.5.
- ✓ Reactive – Wastes that are normally unstable, react violently with water, can explode or release poisonous gases.
- ✓ Toxic – Wastes with high concentrations of certain organic chemicals, heavy metals or pesticides when tested by the Toxicity Characteristic Leaching Procedure (TCLP). Federal regulations contain a list of toxic chemicals.



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Missouri-specific Hazardous Waste – An individual state can regulate wastes as hazardous even if they are not on the federal list. For example, in Missouri certain dioxin wastes are regulated at smaller quantities than in the federal rules.

Mixed Waste – If you mix any waste with a waste that is on the F, P, K or U list, all of it is hazardous, even if there is only a very small amount of listed hazardous waste in the mixture.

Is Your Waste Hazardous? To find out if your waste is hazardous, check to see if it is on the lists of hazardous wastes or if it is a hazardous waste in Missouri. If it is not, you need to find out if it exhibits one or more of the hazardous characteristics. Check the material safety data sheet (MSDS) or contact your supplier for help.

If you are unsure if your waste is hazardous, you will need to have it tested in a laboratory. There are many laboratories who can do this testing. Check the yellow pages or contact DNR at (800) 361-4827 for help.

Managing Hazardous Wastes. There are very specific requirements for managing hazardous waste from your business. The requirements you must meet depend on what and how much waste you generate. You need to know how much acutely hazardous waste (P-listed) and non-acute hazardous waste you generate each month. You also need to know how much of each of these types of waste you accumulate at any one time.

Use the following information to determine your generator status. See guide sheet #13, *Hazardous Waste Management*, for more information on how to label, store and dispose of your hazardous waste.

What Type of Generator Are You?

There are three types of generators: Large Quantity Generator (LQG), Small Quantity Generator (SQG) and Conditionally Exempt Generator (CEG). Here are some general guidelines to help you decide what type of generator you are:

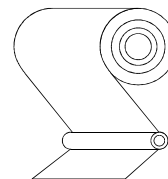
If you generate in one month or accumulate at any one time . . .

- ✓ More than 1 kg (2.2 pounds) of acutely hazardous waste you are an LQG.
- ✓ 1,000 kg (2,200 pounds) or more of non-acute hazardous waste you are an LQG.
- ✓ More than 100 kg (about 220 pounds), but less than 1,000 kg (2,200 pounds) of non-acute hazardous waste AND less than 1 kg of acutely hazardous waste you are an SQG.
- ✓ No more than 100 kg (220 pounds) of non-acute hazardous waste AND less than 1 kg of acutely hazardous waste you are a CEG.
- ✓ In Missouri, anyone generating one gram or more of dioxin waste (2,3,7,8-tetrachlorodibenzo-p-dioxin) is an LQG.

If you are an SQG or LQG you must register with DNR and get a generator identification number. You also must follow regulations on storage, transport, record keeping and reporting. Call DNR for more information.

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HAZARDOUS WASTE MANAGEMENT



If you generate hazardous waste — and most printers do — there are requirements for how you manage that waste. The rules you must follow depend on how much waste you generate. This guide outlines the main requirements. For information on how to decide if your waste is hazardous, see guide sheet #12, *Hazardous Waste*.

This list does not include every requirement for every generator. It is general guidance.

Containers

- ✓ Hazardous waste containers must be in good condition. If a container leaks, transfer waste to a new container.
- ✓ Don't let rainwater accumulate on top of the container.
- ✓ Keep containers closed and use self-closing funnels when adding waste.
- ✓ Use containers that are compatible with the waste. For example, use HDPE (high-density polyethylene) plastic containers for corrosive wastes.
- ✓ Never place incompatible wastes, such as wastes that react with each other (acids and bases) in the same container.

Storage

- ✓ Keep aisle space between container rows to allow inspection for leaks and damage.

- ✓ Store ignitable and reactive wastes at least 50 feet from property boundaries.
- ✓ Store containers of incompatible wastes in separate areas.
- ✓ There may be limits on how long you store your waste.

Labels

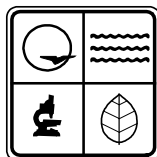
- ✓ Label every container with the type of waste and whether it is hazardous or non-hazardous.
- ✓ Include EPA hazardous waste numbers or Missouri waste code numbers.
- ✓ Include the date waste was first placed in the container.
- ✓ Include your business' name and address.
- ✓ Use the following words on labels for hazardous wastes:

HAZARDOUS WASTE
FEDERAL LAW PROHIBITS IMPROPER
DISPOSAL

If found, please contact the nearest police or public safety authority or the U.S. EPA
(Your business' name and address and manifest document number)

Transport and Disposal

- ✓ Make sure your hazardous waste transporter has an EPA identification number and a Missouri Hazardous Waste Transporter License.



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✓ Make sure the place receiving your waste has EPA identification numbers and the necessary state permits.

✓ Use manifests for hazardous wastes shipped off-site.

Inspections and Record keeping

✓ Inspect containers at least once a week and keep a written log of inspections.

✓ Keep training and inspection records, manifests, shipping receipts and records of lab tests for three years.

✓ Keep land disposal restriction forms for five years.

Training

✓ Train all employees to identify, reduce and properly handle wastes.

✓ Train new employees before they handle hazardous waste.

Notify Missouri Department of Natural Resources (DNR)

✓ If your business is a small or large quantity generator, register as a generator with DNR to get an EPA and Missouri generator identification number.

Emergency Preparedness

✓ Notify police departments, fire departments and local hospitals. They

need to know what hazardous wastes are on your property.

✓ Designate an emergency coordinator. This person must know what to do in case of a fire, spill or other emergency and must be on the premises or on call 24 hours a day.

Contingency Plans

All hazardous waste generators should have a contingency plan for handling emergencies. Large quantity generators must have a written plan that includes the following.

✓ Response arrangements with police, fire, hospitals and emergency response contractors.

✓ Emergency coordinator's address and phone number(s).

✓ On-site emergency equipment descriptions and locations.

✓ Evacuation plan and routes, including a site diagram.

Post Emergency Information

Post the following information near every telephone:

✓ Fire department phone number.

✓ Emergency coordinator's name and phone number.

✓ Fire alarm and extinguisher locations.

✓ Locations of spill control materials.

REMEMBER

You must decide if your waste is hazardous and manage it correctly.

Find ways to eliminate or reduce hazardous wastes. This will reduce the number of requirements you must meet. See the pollution prevention suggestions on other guide sheets, particularly those dealing with inks and solvents.

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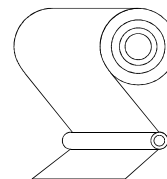
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INK WASTE

Some inks contain chemicals that can harm people and the environment if not properly managed. Solvents found in some inks can cause air pollution and may be hazardous waste when disposed. Also, some pigments contain metals that can cause the ink to be hazardous waste. It is important that you properly manage your inks to protect employees, the community and the environment.

Whether a specific ink is hazardous waste depends on the amount and type of heavy metals, solvents and other chemicals it contains. Hazardous solvents commonly found in inks include ethanol, isopropanol, ethylene glycol, xylene, toluene, cyclohexanone and petroleum distillates. These solvents also contain volatile organic compounds (VOCs).

VOCs are chemicals that can cause indoor health problems such as lung irritation and outdoor problems such as smog. If you use solvent-based inks, you may need to notify the Missouri Department of Natural Resources (DNR) about your air emissions. See guide sheet #4, *Air Quality*, and guide sheet #24, *VOCs and HAPs*, for more information.



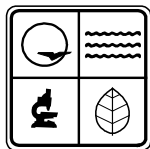
Pigments may contain metals such as lead, chromium, silver, cadmium or barium, causing the waste ink to be hazardous waste depending on the amount of heavy metals in it.

The material safety data sheets (MSDS) for your inks should contain information on what chemicals are in your inks, including the solvents, metals and amount of VOCs. Your MSDS may not contain enough information for you to decide if your inks are hazardous waste or regulated air pollutants. Your supplier should be able to provide you with this information.

If you cannot find out from these sources, contact DNR or another environmental professional for help. You will need the MSDS listing the chemicals in your ink.

If your ink is a regulated hazardous waste it is important that you manage the waste properly. The following guide sheets have information to help you:

- #12, *Hazardous Waste*
- #13, *Hazardous Waste Management*
- #19, *Solvents*
- #20, *Solvent Disposal*
- #21, *Solvent Recycling*
- #22, *Solvent Reuse*



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If your waste ink is not a hazardous waste, check the MSDS for recommended disposal methods. Do not put liquids in your trash. Landfills in Missouri cannot accept liquid waste. You can dry out your waste ink by mixing it with an absorbent material such as kitty litter.

If the drains at your shop lead to a sewer and wastewater treatment plant, you may be able to pour water-based inks down the drain. Contact the wastewater plant to ask if they can accept the water-based solvent. **Do**

not put ink, solvent or other chemicals down the drain unless the wastewater plant has approved. **Do not** put solvent or any industrial waste down your drain if the drain does not lead to a wastewater treatment plant. See guide sheet #25, *Wastewater*, for more information.

Never pour solvent or any other waste onto the ground. Doing that can seriously harm the environment and you. Also, there are serious penalties for illegally disposing of waste.

REMEMBER

Inks may be hazardous waste when discarded. Check your MSDS or ask your supplier. See guide sheet #12, *Hazardous Waste*, for more information.

Inks may contain solvents that are regulated air pollutants. Check your MSDS or ask your supplier. See guide sheet #4, *Air Quality Permitting*, for more information.

There are many nonhazardous inks on the market. Ask your supplier to help you find inks that are not hazardous wastes and that contain little or no VOCs.

Find ways to reduce the amount of ink you use. Reuse waste ink. Work with your supplier to have inks rebled.

POLLUTION PREVENTION

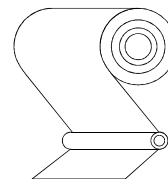
Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ Ask your vendor for nonhazardous inks.
- ✓ Work with vendors who can rebled old or waste inks.
- ✓ Buy only as much ink as will be needed in the near future. Use up old ink before ordering more.
- ✓ Use a scraper or spatula to remove as much ink as possible from containers and stir sticks.
- ✓ Tell customers which inks are environmentally preferable.

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PARTS WASHERS



Flexographic printers sometimes use parts washers for cleaning parts and tools. Most parts washers use either solvent or water-based cleaners. Depending on the cleaner used and the items being cleaned, the waste from parts washers may be hazardous.

Solvent Washers

Many people use solvents for cleaning parts.

Some solvents evaporate readily and can cause air pollution problems. For this reason the use of certain solvents is restricted in some areas, such as St. Louis and Kansas City. Check with your local air pollution control office or the Missouri Department of Natural Resources (DNR) for any special requirements for your solvents.

Some solvents used in parts washers are hazardous waste when disposed. If you don't know whether your used solvent is a hazardous waste, ask your supplier or manufacturer. The material safety data sheet (MSDS) may have this information.

Even if the solvent is not hazardous waste, the used solvent can be hazardous due to contamination from the parts you clean. Your supplier may be able to provide information on typical contaminants, or you may need to have the waste solvent tested.

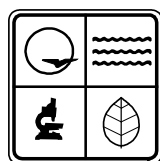
See guide sheet #12, *Hazardous Waste*, for more information.

Some businesses use solvent-distillation units, often called stills. These remove contaminants to recycle the solvent. If you recycle your hazardous waste solvent on-site you must notify DNR. If you recycle more than 2,200 pounds of hazardous waste in a month, you must get a resource recovery certification from DNR. The residues from these units may be hazardous waste.

Water-based Washers

Many water-based parts washers are available. Typically these are closed units that use very hot water and detergents with rust inhibitors. They work very much like home dishwashers. The units are often designed to filter oil and impurities from the water during operation.

If you have or are thinking of using this type of washer, you must still be concerned about hazardous waste issues. Contact the supplier to learn if the detergent is regulated as a hazardous waste. As with solvent units, the contamination from the parts you are cleaning could cause the waste to be hazardous. You may need to have the wastewater, filters or sludges tested to find out if they are hazardous.



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If you plan to put wastewater from your parts washer down the drain, contact your sewer system personnel to make sure it is okay with them. If your wastewater is treated by an on-site system, such as a lagoon or septic tank, you cannot put wastewater from your business operations down the drain. You will need to contain your wastewater and dispose of it at a facility

able to accept it. For this reason, it may be more costly to use a water-based parts cleaning system if your business is on a septic system. See guide sheet #25, *Wastewater*, for more information. Do not let untreated wastewater drain out on the ground or to any body of water.

REMEMBER

Solvents or detergents used in parts washers may be regulated as hazardous waste.

Contaminants from dirty parts can cause waste solvent or wastewater to be hazardous.

You must notify DNR if you recycle hazardous waste on-site. If you recycle over 2,200 lbs. in a month, you must get a resource recovery certification.

Check with your sewer plant to see if it is okay to pour wastewater from your parts cleaner down the drain.

Never drain untreated wastewater onto the ground, into storm sewers or into any body of water.

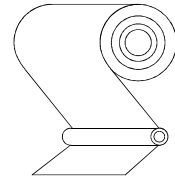
POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ Close the lid on your parts washer and turn off the spray nozzle when not in use. This will decrease evaporation of solvent.
- ✓ Consider a solvent distillation unit (still). These units can extend the life of the solvent, saving raw material expense and hazardous waste disposal costs.
- ✓ Use slightly dirty solvent for initial rinsing of parts.
- ✓ Maintain parts washers. Check to make sure seals are tight and there are no leaks.

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PLATE DISPOSAL



When your flexographic plates are too worn to use again or are no longer needed, they typically can be recycled or discarded with your regular trash.

There are several good sources of information on recyclers. To find recyclers in your area,

- ✓ Check the yellow pages of the phone directory.
- ✓ Contact your community's solid waste or public works office.
- ✓ Check with other businesses in your area to ask if they know of recyclers.
- ✓ Call your newspaper. In some areas, the newspaper publishes lists of recyclers.
- ✓ Ask your trade association. See guide sheet #26 for a list of trade associations and other contacts.

If you store plates before recycling, store them apart from other recyclable materials.

Keeping materials separated makes recycling easier and can sometimes increase the price the recycler pays or reduce the price the recycler charges.

If you plan to dispose of your plates, contact your landfill and waste hauler to see if they have any special handling requirements.

Never burn waste from your business.

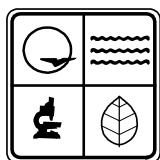
Be sure all of your waste goes to a place legally able to accept it. Never try to dispose of waste on your own property. Doing that is bad for the environment and can make it difficult to sell your property. There are serious penalties for illegal waste disposal.

REMEMBER

Be sure all of your waste goes to a place legally able to accept it.

Do not burn wastes from your business.

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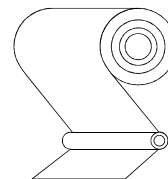
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Preventing Pollution in Flexographic Printing - Guide Sheet #17

PRESS CLEANING



One of the largest sources of air pollution in print shops is from chemicals used in press cleaning. Many of these products contain volatile organic compounds (VOCs). These chemicals can harm people and cause air pollution. To protect human health and the environment, regulations limit the amount of VOCs or other air pollutants businesses can release. Guide sheets #4, *Air Quality*, and #24, *VOCs and HAPs*, have more information.

Many press cleaning chemicals are also regulated as hazardous waste. This can affect how you manage any waste chemicals and how you manage the shop towels, or wipes, used to clean the press. Guide sheet #18, *Shop Towels*, has more information.

To find out if your cleaning products contain VOCs, check your material safety data sheet (MSDS). The MSDS may also have information on whether the chemical is a hazardous waste. If you can't find this information on the MSDS, contact your supplier or manufacturer.

Work with your supplier to find low-VOC, nonhazardous products. Using less hazardous cleaning chemicals can help protect workers, the community and the environment.

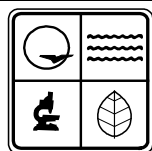
Substitutes may cost more per gallon than traditional products, but printers often find they use less and save money in related areas. Other costs to keep in mind are the costs of complying with environmental and safety regulations, including hazardous waste disposal costs. Substitutes that seem more expensive may actually cost your business less than high-VOC chemicals.

Even a small reduction in the VOC content of your cleaners will reduce air emissions. There are substitute products with very low percentages of VOCs, including vegetable esters and terpenes.

Be sure to get information on how to use the material properly. Substitute cleaners won't work the same as traditional cleaners. You will need to take the time to find out which works best in your shop.

The following tips are based on information developed by the United States Environmental Protection Agency (EPA) and the Printing Trade Associations Nationwide.

- ✓ Oily films may be left behind by substitutes. Experiment to see if this causes a problem. If it does, use a water-dampened wipe to remove the oil film.



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✓ Keep in mind that low-VOC substitutes take longer to dry than high-VOC cleaners. If this is a problem, use a clean, dry wipe to wipe off any dampness.

✓ Many printers prefer to use only one product to clean the press. Check with your supplier find out if the substitute you are considering is compatible with all parts of your press.

✓ Some substitutes are thicker than traditional cleaners and may not absorb as quickly into shop wipes. Keep a supply of shop wipes and wash mixed together in a covered container. When you need a wipe, get one from this container, wringing out excess wash back into the container.

✓ Substitute cleaners don't work the same way as traditional cleaners. You may need to let the cleaner set on the press for a short time after applying before you wipe it off.

REMEMBER

Cleaning chemicals can be hazardous waste. They can also be regulated air pollutants. Find out how your cleaning chemicals are regulated.

See these guide sheets for more information:

#4, *Air Quality*

#12, *Hazardous Waste*

#19, *Solvents*

Reduce pollution and protect worker health by using low-VOC, HAP-free chemicals.

POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

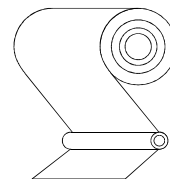
✓ Keep cleaners and solvent-soaked rags in covered containers.

✓ Don't pour cleaning products onto the press. Instead, put the product on a towel or wipe, then wipe off the part to be cleaned.

✓ Train staff about environmental risks and costs. Ask them for suggestions on ways to reduce waste and pollution. Employees can be the best source of pollution prevention ideas.

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SHOP TOWELS



Discarded shop towels or rags, either cloth or paper, may be contaminated with hazardous wastes. If they are, the towels or rags may be hazardous waste.

Listed hazardous wastes include solvents such as methyl ethyl ketone, toluene, xylene, and others. A waste can also be hazardous if it is toxic, ignitable, reactive or corrosive. This type of waste is called a characteristic hazardous waste. See guide sheet #12, *Hazardous Waste*, for more information on what wastes are hazardous.

Any waste that is mixed with a listed hazardous waste becomes a hazardous waste. Towels with a listed hazardous waste on them become hazardous waste themselves when you discard them. The towels could also be characteristic hazardous waste. Often solvent-soaked towels can burst into flames, which means they are regulated as ignitable hazardous waste.

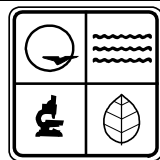
The best way to deal with this issue is to prevent the problem. If you use nonhazardous cleaning solvents, the solvent won't cause the towel to become hazardous waste.

If used towels or rags are laundered and reused, they are not regulated as a solid waste or as a hazardous waste. You should tell your laundry what kind of chemicals are on the shop towels and make sure they can handle that type of material.

If you wash your own shop towels, be sure to check with your wastewater treatment plant to find out if they can accept the wastewater discharge you are putting down the drain. You may need to pretreat your wastewater. Do not launder contaminated shop towels if the wastewater does not go to a treatment plant.

Do not launder towels or rags used to clean up spills of hazardous waste. If you use shop towels to clean up spills of listed hazardous waste, the shop towels are hazardous waste and must be disposed of at a permitted hazardous waste treatment, storage or disposal facility.

If you plan to throw away dirty shop towels or rags, you need to find out if they are hazardous waste. If the shop towels are hazardous, you must comply with the regulations for management, storage, transport and disposal of hazardous waste.



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If your used towels are nonhazardous, you may send them to a sanitary landfill. Landfills cannot accept liquids, so be sure to collect and use any liquid from your shop towels.

Remember that oily or solvent-soaked towels can catch fire easily. Even rags soaked with nonhazardous solvents can be a fire hazard. Store them safely. Some people spray the rags with water to prevent fires.

REMEMBER

Shop towels used to clean up spills of listed hazardous waste must be managed as hazardous waste.

Shop towels contaminated with listed hazardous waste are hazardous waste.

If dirty shop towels are laundered and reused, they are not waste. Let the laundry know what type of solvents or other material is on the dirty towels.

Don't wash your dirty shop towels unless the wastewater goes to a wastewater treatment plant. Check with staff at the treatment plant to be sure it can handle the wastewater

If you are throwing away contaminated shop towels, you must find out if they are hazardous waste and follow the regulations that apply. See guide sheet #12, *Hazardous Waste*.

POLLUTION PREVENTION

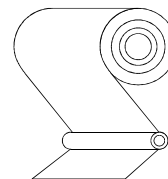
Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

- ✓ Use nonhazardous cleaners and solvents.
- ✓ Don't use shop towels to clean up spills of hazardous materials. Use drip pans to prevent spills and appropriate absorbents for cleanup.
- ✓ Use the least amount of solvent needed.
- ✓ Collect and recycle solvents from contaminated shop towels. You can use a wringer, centrifuge or similar device to remove the liquid. Some companies use screen-bottom drums for their used shop towels. Reuse or market the collected solvents if possible.

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Preventing Pollution in Flexographic Printing - Guide Sheet #19

SOLVENTS



Waste solvents used in cleaning make up a big part of the hazardous wastes from flexographic printing. You can help protect the environment, protect workers in your shop and save money by reducing the amount of solvent you use and by reusing or recycling your solvent.

Air Pollution From Solvents

Many solvents contain volatile organic compounds (VOCs). These are chemicals that get into the air and can harm people and the environment. The material safety data sheet (MSDS) will have information on the amount of VOCs in the products you buy. Always try to use the material with the lowest percentage of VOCs possible. Missouri has rules to protect air quality. The types of rules that apply to your shop depend on the type and quantity of inks, blanket wash and solvents you use, as well as the size of your operation. See guide sheet #4, *Air Quality*, and guide sheet #24, *VOCs and HAPs*, for more information.

Waste Solvent

Many waste solvents are hazardous wastes. Some used solvents and still bottoms are on a list of hazardous wastes called the F list. Some unused solvents are on the U list. Common hazardous waste solvents include

trichloroethylene, tetrachloroethylene (perc), methylene chloride, xylene, acetone, methyl ethyl ketone, toluene and others.

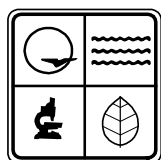
Some used solvents are hazardous because they are ignitable, toxic, reactive or corrosive. If the waste solvent has a flash point of less than 140 F it is an ignitable hazardous waste. The flash point is the temperature at which the solvent will catch on fire. If the pH is 12.5 or higher or if it is 2 or lower, the solvent is hazardous waste.

Waste solvent should be reused, recycled on-site, recycled off-site or, as a last resort, disposed of as a hazardous waste. See these guide sheets for more information:

- #12, *Hazardous Waste*
- #13, *Hazardous Waste Management*
- #20, *Solvent Disposal*
- #21, *Solvent Recycling*
- #22, *Solvent Reuse*

Reducing Solvent Waste

Solvents can be expensive to purchase and to dispose. It makes good sense to try to reduce the amount of solvent you use. Often, the solvent that you use can be reused or recycled, which means you can purchase less new solvent. When you reduce the amount of solvent you use, you save money and you protect the environment.



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Here are some ideas for reducing solvent use at your shop:

- ✓ Keep solvent containers, parts washers and solvent sinks closed. Any solvent that evaporates at your shop is solvent you paid for and can't use. Some people estimate that as much as 40 percent of solvents are lost due to evaporation, equipment leaks, spills or inappropriate use.
- ✓ Set up and follow a maintenance schedule for equipment. This can prevent leaks.
- ✓ Check regularly for leaks, drips and spills. Repair leaks and clean up spills right away.
- ✓ Schedule jobs to reduce the need to clean between jobs.
- ✓ Use slightly dirty solvent for the first rinse of equipment.
- ✓ Use a scraper or spatula to remove ink from stir sticks and containers.
- ✓ Keep solvent containers, parts washers and solvent sinks closed. This is so important the list begins and ends with it.

REMEMBER

Your solvent may be hazardous waste.

Ask your supplier if nonhazardous solvents are available.

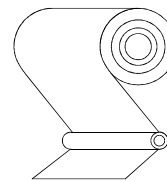
Solvent that evaporates is solvent you paid for and can't use. Keep containers tightly closed and in good condition.

Use the solvent with the lowest VOC content possible.

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Preventing Pollution in Flexographic Printing - Guide Sheet #20

SOLVENT DISPOSAL



Solvent is expensive to buy and to discard. It makes sense to try to reduce the amount of solvent you use. Reuse or recycle your used solvent. Only as a last resort should you dispose of solvent. See these guide sheets for more information:

- #19, *Solvent*
- #21, *Solvent Recycling*
- #22, *Solvent Reuse*

Many waste solvents are hazardous wastes. It is very important that you manage your hazardous wastes according to the regulations. Guide sheets #12 and #13, *Hazardous Waste and Hazardous Waste Management*, have more information.

To properly manage your waste solvent you need to

- ✓ Find out if your waste is hazardous.
- ✓ Figure out how much hazardous waste you generate.
- ✓ Learn what rules apply to you based on how much waste you generate.
- ✓ Use the services of a waste transporter and disposal or recycling company legally able to take your waste.

Is Your Waste Hazardous?

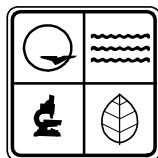
Some waste solvents are on a list from the federal government of wastes regulated

as hazardous. These are called "listed" hazardous wastes. Commonly used solvents on this list include trichloroethylene, methylene chloride, xylene, acetone, methyl ethyl ketone (MEK), toluene and others.

Some solvents are characteristic hazardous wastes, which means they are ignitable, toxic, reactive or corrosive. If the waste has a flash point of less than 140 F it is an ignitable hazardous waste. The flash point is the temperature at which the solvent will catch on fire. Corrosive hazardous waste has a pH of 2 or less or a pH of 12.5 or higher.

Your solvent supplier should be able to tell you if your solvent is a hazardous waste, or you can check with the manufacturer. If you cannot find out from these sources, contact the Missouri Department of Natural Resources (DNR) or another environmental professional for help. You will need the material safety data sheet (MSDS).

Even if the solvent itself is not a hazardous waste, the ink or dirt in it may cause the used solvent to be a hazardous waste. If any contaminant in your used solvent is hazardous, your used solvent may be hazardous waste. Contact DNR for more information on this.



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If your waste solvent is a listed hazardous waste, anything it is mixed with is hazardous waste. For example, if you use listed solvent on your shop towels, the towels become hazardous waste when discarded.

Managing the Waste

You need to keep track of how much hazardous waste you generate. The rules you must follow depend on how much waste you generate. To learn more about this, see guide sheet #12, *Hazardous Waste*.

Always keep good records about your waste — how much and what you generate, who transports it and where it goes. In most cases, you will need to get a generator identification number from DNR and use a manifest when you ship the waste off-site. The company that transports your hazardous waste must have a Missouri Hazardous Waste Transporter License.

Be sure your waste is going to a place that is legally allowed to take it. For a list of hazardous waste facilities in Missouri or a list of resource recovery facilities (recyclers), contact DNR at (800) 361-4827.

REMEMBER

Find out if your waste solvent is a hazardous waste. Ask your supplier for nonhazardous solvents.

Be sure anyone who takes your waste is legally able to do so.

Never pour any waste onto the ground and never pour any chemicals down the drain unless you have permission from the wastewater plant.

For more information on managing your hazardous waste solvent, see guide sheet #13, *Hazardous Waste Management*.

If your waste solvent is not a hazardous waste, check the MSDS for recommended disposal methods. Do not put liquids in your trash. Landfills in Missouri cannot accept liquid waste.

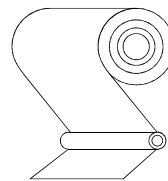
If the drains at your shop lead to a sewer and wastewater treatment plant, you may be able to pour water-based solvents down the drain. Contact the wastewater plant to ask if they can accept the water-based solvent. **Do not** put solvent, paint or other chemicals down the drain unless the wastewater plant has approved. **Do not** put solvent or any industrial waste down your drain if the drain does not lead to a wastewater treatment plant. See guide sheet #25, *Wastewater*, for more information.

Never pour solvent or any other waste onto the ground. Doing that can seriously harm the environment and you. Also, there are serious penalties for illegally disposing of waste.

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Preventing Pollution in Flexographic Printing - Guide Sheet #21

SOLVENT RECYCLING



Whether you recycle your solvent on-site or have someone pick it up for recycling elsewhere, recycling your used solvent helps protect the environment and can save money. You need to find out if your used solvent is regulated as hazardous waste. You can find information on how to do that in guide sheet #12, *Hazardous Waste*, and guide sheet #19, *Solvents*.

This guide sheet deals with recycling hazardous waste solvent. If your used solvent is not hazardous waste, check with your recycling equipment vendor for information on managing wastewater and waste from the recycling unit. You can also call the Missouri Department of Natural Resources (DNR) for help.

On-site Recycling

Most on-site recycling of solvent is done with a distillation unit called a still. Used solvent is put in the still and heated to the boiling point. The solvent vapor is then cooled, producing nearly pure solvent. There are also recycling units that filter the used solvent.

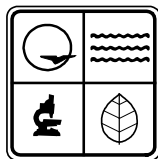
To figure the cost savings from on-site recycling, consider the cost of new solvent

and the cost of off-site recycling. In general, shops that generate 50 gallons of waste solvent per month will get their money back on a small still in about a year.

You need to contact DNR before you begin recycling your solvent on-site. For small amounts, you need to notify the DNR's Hazardous Waste Program, P.O. Box 176, Jefferson City, MO 65102. Send a letter that includes your name, the name and location of your facility, the wastes being recovered and the approximate quantity of waste recovered each year.

If you recycle more than 1,000 kilograms (2,200 pounds or about 260 gallons) on-site in a month, you must send an application to DNR for a resource recovery certification. Contact DNR to get an application form. There will be a \$100 application fee.

After the solvent is distilled, there will be some settled residue called still bottoms. This material is a hazardous waste. If your recycling unit filters used solvent, the used filters may also be hazardous waste. Store the waste still bottoms or filters in a closed container labeled with the date you first put the waste in the container and the words "Hazardous Waste."



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All hazardous wastes from your solvent recycling must be properly handled and disposed. See guide sheet #13, *Hazardous Waste Management*, for more information.

Some recyclers have mobile recycling services. They bring equipment to your shop and recycle your solvents there. These businesses must have resource recovery certification in Missouri. If you use this type of service, ask the recycler to give you a copy of the approval letter from DNR.

Off-site Recycling

You may choose to recycle waste solvents off-site with a commercial recycler. Some businesses will transport and recycle your solvent. Other recyclers offer a solvent tank maintenance service. They will come to your shop, remove the solvent and sludge from your tank and replace it with clean solvent. Solvent recycling facilities in Missouri must have resource recovery certification from DNR.

If you send your waste solvent off-site, whether for recycling or disposal, you need to follow all hazardous waste requirements. The company that transports your waste solvent must have a Missouri hazardous waste transporter license. Other requirements depend on how much waste you generate. In most cases you will need to get a generator identification number from DNR and use a manifest when you ship the waste off-site. Be sure you get a copy of the completed manifest.

In some cases you can have a contract with your solvent recycler instead of using a hazardous waste manifest. Small quantity generators of hazardous waste can do this. See guide sheet #12, *Hazardous Waste*, to learn if you are a small quantity generator. The agreement with your recycler must include the type of waste and frequency of shipments. The waste must be transported to the recycling facility and the recycled material brought back to you in the recycler's own vehicle.

REMEMBER

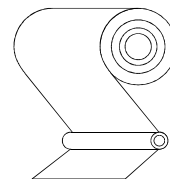
If you recycle your hazardous waste solvent, you need to notify DNR. You may need a resource recovery certification.

If someone else recycles your hazardous waste solvent, that person needs a resource recovery certification from DNR.

Still bottoms and filters from recycling solvent usually are hazardous waste. Store them in closed, labeled containers before disposing of them with a facility legally able to accept hazardous waste.

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SOLVENT REUSE



Many cleaning solvents and thinners are regulated as hazardous waste. They also may contain chemicals that can cause air pollution. For many printers, solvents are also a major expense. Reusing solvent can help protect the environment and save money.

Reusing Solvent

It can be easy and inexpensive to reuse your solvent. You can use the dirty solvent as a first rinse for dirty equipment. Another method is to settle out the solids in your used solvent. Put the used solvent in a container and leave it undisturbed until the solids settle out. Siphon off the liquid solvent with a drum pump. Filtering equipment is also available for used solvent.

If you filter your solvent it is considered recycling and other rules may apply. See guide sheet #21, *Solvent Recycling*.

Eventually your solvent may be too dirty to reuse. When this happens, you should recycle it. Recycling, like reuse, saves money and helps protect the environment. Dispose of used solvent only as a last resort.

If you need to recycle or dispose of your used solvent, you must find out if it is hazardous waste and follow the requirements for managing the waste.

These guide sheets have more information:

- #12, *Hazardous Waste*
- #13, *Hazardous Waste Management*
- #19, *Solvents*
- #20, *Solvent Disposal*
- #21, *Solvent Recycling*

Permits for Reusing Solvent

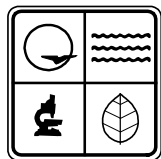
You do not need a permit from the Missouri Department of Natural Resources (DNR) if you simply allow solids to settle out of your used solvent at your shop. However, if you filter your used solvent or process it in some other way there may be hazardous waste rules that apply. Also, the material (sludge) that settles out may be hazardous waste.

Storing Used Solvent

If your used solvent is hazardous waste, you must store it according to hazardous waste rules even if you plan to reuse it. Store hazardous waste in a closed container labeled with the words "Hazardous Waste" and the date you first put waste in it. The length of time you can store the waste depends on how much waste you generate. See guide sheet #13, *Hazardous Waste Management*, for more information.

Managing Sludge

Usually the sludge that settles out of used solvent is hazardous waste because it is



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ignitable or toxic or because the solvent is a listed hazardous waste.

If the sludge has a flash point of less than 140 F, it is ignitable hazardous waste. This means the waste will catch on fire at less than 140 F. If it contains toxic materials (usually metals like chromium or lead) over certain levels it is a toxic hazardous waste. Corrosive hazardous wastes have a pH of 12.5 or more or a pH of 2 or less.

If the solvent is on one of the lists from the federal government of materials regulated as hazardous waste, the sludge is a listed hazardous waste. Solvents on this list include trichlorethylene, tetrachloroethylene (perc), methylene chloride, xylene, acetone, methyl ethyl ketone (MEK), toluene and others.

The material safety data sheets (MSDS) for your solvents and inks should indicate the chemicals (such as toluene, etc.), the flash point, the pH and any toxic chemicals present in large quantities. You can check with your solvent vendor to find out if the

solvent is hazardous waste. If it is, you can assume the sludge is hazardous. If the solvent is not hazardous, the sludge may still be hazardous because of contaminants in it.

If you don't know from your MSDS or some other authority that your sludge is nonhazardous, you will need to have it tested. A laboratory will need to measure the flash point and do a Toxicity Characteristic Leaching Procedure (TCLP).

There are many laboratories that will do these tests. Check your phone book, ask your vendor or contact your trade association for suggestions. The TCLP will only need to test for the chemicals that you expect to find in your waste.

If you know your waste is nonhazardous, either by your own knowledge or by testing, it can go in your regular trash if the waste is dry. Liquid nonhazardous waste can be dried out by mixing it with an absorbent like kitty litter. Always check with your local sanitary landfill officials to make sure they will accept this waste.

REMEMBER

Reduce the amount of solvent you use. Reuse your used solvent if possible. Recycling is the next best option.

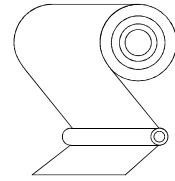
Sludge or filters that come from cleaning up your used solvent may be hazardous waste.

POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. To prevent pollution, look for ways to reduce the amount of solvent you use and ask your supplier for nonhazardous solvents and inks.

*For more information call (800) 361-4827 or write to
Missouri Department of Natural Resources
Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102-0176*

STORM WATER PERMITS



Rainwater and melting snow or ice can easily become polluted if it comes in contact with contaminants. If not properly managed, contaminated water can harm the environment, pollute creeks and lakes, and even contaminate drinking water.

To prevent environmental and human health problems, the federal Clean Water Act requires a permit to discharge water that has contamination in it, including stormwater. This permit is called a National Pollutant Discharge Elimination System (NPDES) permit. The Missouri Department of Natural Resources (DNR) issues these permits in Missouri where they are called Missouri State Operating Permits.

You **must** apply for and obtain a Missouri State Operating Permit for storm water discharge if you own or operate a printing operation unless

- ✓ You do not store materials outside or
- ✓ Your site is located in an area where storm sewers drain to a wastewater treatment plant. Your local public works office can tell you if your storm sewers lead to the wastewater treatment plant.

The requirements of the discharge permit are intended to minimize or prevent water pollution. In Missouri, the storm water permitting requirements are being handled in two ways: general and site-specific permits.

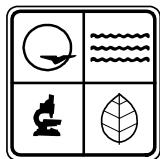
General Permit

General permits cover an entire industry, but the individual facility operator still must apply for it. General permits are issued statewide for periods of five years. If an individual business applies for the permit in the middle of the five-year period, they will get less than five years on their first permit.

Site-Specific Permit

When a business stores toxic materials or large amounts of potential contaminants exposed to rainfall, needs close monitoring, or is one of only a few of its kind in the state, it may need a site-specific permit.

A site-specific permit takes into account the individual characteristics of the site and the storm water runoff. In some cases, DNR may require the owner or operator of a site to apply for a site-specific permit in order to better protect water quality.



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REMEMBER

If you own or operate a printing business in Missouri, you must have a Missouri State Operating Permit for your storm water discharge unless

- Your business is located in an area with combined sanitary and storm sewers, or
- You do not store materials outside.

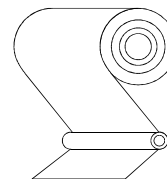
POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Your permit may require certain pollution prevention practices or even a pollution prevention plan. Here are some suggestions:

- √ Prevent spills.
- √ Use interceptor dikes, swales or berms to direct storm water away from storage areas and areas that are prone to erosion.
- √ Revegetate disturbed or bare soil areas as soon as possible.
- √ Maintain appropriate spill containment equipment and train employees how to use it.
- √ Store materials indoors if possible.

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VOCs and HAPs



Many inks and cleaning solvents used in the printing industry contain chemicals referred to as volatile organic compounds (VOCs) or hazardous air pollutants (HAPs).

VOCs are chemicals that evaporate into the air, then react with sunlight to form urban ozone (smog). Smog has serious health effects on the human respiratory system. Aside from coughing, headaches and nausea, smog can cause permanent lung damage.

HAPs are chemicals that are believed to cause cancer. Exposure to HAPs can also cause health effects such as birth defects, nerve disorders and other chronic and acute diseases. Many VOCs are also HAPs.

To protect public health and the environment, federal and state regulations limit the amount of VOCs or HAPs that can be released into the air by businesses such as printers. If you use chemicals that contain VOCs or HAPs, you may be subject to these regulations. See guide sheet #4, *Air Quality*, for more information.

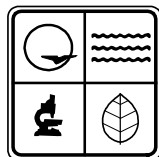
VOCs are the primary air pollutant for which printers are regulated. Regulated air emissions come primarily from inks, cleanup solvents, fountain solutions, blanket washes, coatings and adhesives.

Some VOCs and HAPs Reported by Missouri Flexographic Printers*

Dibutyl phthalate
Diethylene
Diethylene glycol
Ethyl benzene
Ethylene glycol
Glycol ethers
Isophorone
Methanol
Methyl ethyl ketone (MEK)
Methyl isobutyl ketone
Naphthalene
Toluene
Vinyl acetate
Xylene

*This is not a complete list of chemicals regulated as air pollutants. Contact DNR for more information.

Check the material safety data sheet (MSDS) for each product your facility uses. This should list the VOCs or HAPs contained in the product. Your supplier should be able to help you find this information.



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VOCs and HAPs pose a risk to employee health, public health and the environment. Many of these chemicals are also regulated as hazardous waste. They may also increase the risk of fire or explosion. Most printers find it is worthwhile to find ways to reduce the amount of these chemicals they use. Here are some suggestions for how you can reduce VOC and HAP use in your shop:

- ✓ Work with your vendors to find products that contain little or no air pollutants. Look for low-VOC, HAP-free inks, adhesives, blanket washes, coatings and other compounds. Don't forget about maintenance chemicals, paints and cleaning chemicals.
- ✓ Recycle waste inks. Waste inks of different colors can be blended together to make black ink. Look for ink vendors who will take your waste ink for reblending.
- ✓ Reclaim ink and solvents using an on-site distillation unit. See guide sheet #21, *Solvent Recycling*, for more information.

- ✓ Store VOC-containing materials in closed containers. Open containers allow VOCs to evaporate, causing air pollution and wasting money.
- ✓ Use closed containers for solvent at workstations.
- ✓ Add receiving funnels with automatically closing covers to storage containers to reduce spills and evaporation.
- ✓ Collect and store used rags in a self-sealing, flame-resistant cans. If the rags are regulated hazardous waste, be sure the containers are properly labeled. See guide sheet #18, *Shop Towels*.
- ✓ Use the least amount of cleaner possible.
- ✓ Be sure your employees realize the risks and costs associated with VOCs and HAPs. Train them to use good housekeeping and pollution prevention practices such as those described here. Ask for their ideas on preventing pollution.

REMEMBER

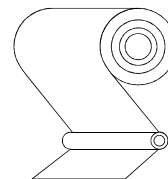
VOCs are volatile organic compounds. HAPs are hazardous air pollutants. These chemicals can cause air pollution and pose a threat to human health and the environment.

VOCs and HAPs are regulated air pollutants. They may also be regulated hazardous waste. Learn what chemicals you have and follow the rules that apply to them.

Insist that your supplier help you find chemicals with little or no VOCs or HAPs. Look especially for low-VOC, HAP-free inks, cleaners, coatings, blanket wash and adhesives.

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Jefferson City, MO 65102-0176*

WASTEWATER



Printing businesses generate wastewater during daily operations. Sources of wastewater include shop cleanup, press cleaning and photoprocessing. These wastewaters may contain metals, solvents or other contaminants that can cause them to be hazardous. They may also contain oils, greases, solvents and detergents.

Most communities provide sewer collection and wastewater treatment facilities. If your business is connected to a sewer and treatment plant, contact them to explain the materials you wish to dispose of in the sewer system.

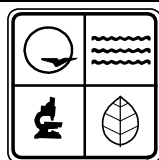
You may need to pretreat the wastewater in some way before putting it in the sewer. For example, an oil/water separator or treatment for a particular contaminant may be required. By pretreating your wastewater, you help assure the community's sewer and treatment system continues working for everyone.

In areas where a wastewater treatment facility is not available or cannot take your water, you must carefully manage the wastewater from your business. If the wastewater is hazardous, you must manage it by sending it to a permitted hazardous waste facility. See guide sheet #12, *Hazardous Waste*, for more information.

If your wastewater is not hazardous, you can haul it to an approved wastewater treatment plant if the plant agrees. Also, if the wastewater is not hazardous, you may be able to treat it yourself. This will require a permit from DNR to assure that the treatment process you want to use will properly treat your wastewater.

If you cannot connect your shop to a wastewater treatment plant, you may be able to discharge domestic wastewater (water from restroom or kitchen facilities) to a septic system. On-site septic systems that treat domestic wastewater are regulated by county health departments. You will still need to collect any industrial wastewater (water from parts washers, floor cleaning, etc.) and manage it as described previously. **Do not** put your industrial wastewater down the drain unless you are connected to a sewer and treatment plant and have permission from the plant.

Management practices that reduce, reuse and recycle the wastewater can greatly reduce your disposal costs. They will also help protect sewer systems and treatment plants. See the pollution prevention section that follows for some ideas.



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(800) 361-4827



REMEMBER

If your business is connected to a sewer system and treatment plant, contact the treatment plant to find out if you can put your wastewater down the drain. You may need to pretreat your wastewater before it goes to the treatment facility.

If your business is not connected to a sewer system and treatment plant, you can

- Get a permit from DNR to treat the wastewater yourself, OR
- Collect the industrial wastewater and determine if it is hazardous waste. If it is hazardous waste, send it to a permitted hazardous waste facility. If it is not, you can haul it to an approved wastewater treatment plant if the plant agrees to accept it.

Do not send wastewater from your business (except restroom or kitchen waste) to a septic system.

Never let untreated wastewater from your business go outside onto the ground, down a storm drain or into a body of water.

POLLUTION PREVENTION

Preventing pollution can save money, protect the environment and reduce risk to people. Here are some suggestions:

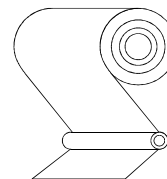
- ✓ Use a scraper or spatula to remove excess ink from equipment and reuse the ink.
- ✓ Minimize spills. Use absorbents to clean up minor fluid leaks and spills.
- ✓ Sweep floors before washing them.
- ✓ If you do photoprocessing at your business, recover silver from the wastewater.
- ✓ Consider using digital or direct-to-plate imaging. These technologies can increase efficiency and eliminate some pollutants.

*For more information call (800) 361-4827 or write to
Missouri Department of Natural Resources
Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102-0176*

Preventing Pollution in Flexographic Printing - Guide Sheet #26

CONTACT LIST

There are many organizations that can be of assistance to lithographic printers in Missouri. This list includes some of them.



Trade Associations

Printing Industries of St. Louis
The Joseph White Building
1790 S. Brentwood Blvd.
St. Louis, MO 63144-1312
Phone: (314)962-6780
Fax: (314) 962-4490

Printing Industries Association of
The Heartland
250 Richards Road, Suite 267
Kansas City, MO 64116
Phone: (816) 421-7677
Fax: (816) 421-7073

Graphic Arts Technical Foundation
4615 Forbes Avenue
Pittsburgh, PA 15213-3796
Phone: (412)621-6941
Fax: (412) 621-3049

North American Graphic Arts Suppliers Association
1720 Florida Ave., NW
Washington, DC 20009-2660
Phone: (202) 328-8441
Fax: (202) 328-8513

Research and Engineering Council of the Graphic
Arts Industry
Marshallton Bldg., Rt. 1
Box 639
Chadds Ford, PA 19317
Phone: (610) 388-7394
Fax: (610) 388-2708

National Association of Printers and Lithographers
780 Palisade Ave.
Teaneck, NJ 07666-3196
Phone: (201) 342-0700
Fax: (201) 692-0286

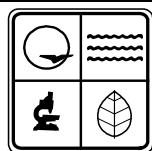
Technical Association of the Graphic Arts
68 Lomb Memorial Dr
Rochester, NY 14623-5604
Phone: (716)475-7470
Fax: (716) 475-2250

National Association of Printing Ink Manufacturers
777 Terrace Ave.
Heights Plaza
Hasbrouck Heights, NJ 07604-3110
Phone: (201) 288-9454
Fax: (201) 288-9453

Pollution Prevention Assistance Providers

Missouri Department of Natural Resources
Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102
Phone: (800) 361-4827 or (573) 526-6627
Fax: (573) 526-6627
<http://www.dnr.state.mo.us/homednr.htm>

Mid-America Manufacturing Technology Center
(MAMTC)
800 W. 14th St., Suite 111
Rolla, MO 65401
Phone: (800) 956-2682
Fax: (573) 341-6869
<http://www.tcnet.org/mamtc>



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Printers National Environmental Assistance Center
3333 W. Arthington
Chicago, IL 60624
Phone: (608) 265-2361
<http://www.ins.uiuc.edu/pneac/pneac.html>

Small Business Development Centers

There are local offices throughout Missouri. To find the office nearest you, call
Phone: (573) 882-4142
Fax: (573) 882-2595

**Office of Waste Management
University of Missouri Outreach &
Extension**

1031 E. Battlefield, Suite 214
Springfield, MO 65807
Phone: (417) 889-5000
Fax: (417) 889-5012
<http://outreach.missouri.edu/owm/>

Solid Waste Management Districts

The state is divided into 20 districts dealing with solid waste issues at the local level. These districts can provide information on local recycling and waste reduction options. Call DNR at (800) 361-4827 to get the phone number for your local district.

State and Federal Agencies

Missouri Department of Natural Resources
PO Box 176
Jefferson City, MO 65102
Air Pollution Control Program
(573) 751-4817
Hazardous Waste Program
(573) 751-3176
Land Reclamation Program
(573) 751-4041
Public Drinking Water Program
(573) 751-5331
Soil & Water Conservation Program
(573) 751-4932
Solid Waste Management Program
(573) 751-5401
Water Pollution Control Program
(573) 751-1300

Missouri Business Assistance Center
Missouri Department of Economic Development
301 W. High Street
Jefferson City, MO 65101
Phone: (800) 523-1434
<http://www.ecodev.state.mo.us/mbac>

US Environmental Protection Agency (EPA)
Region 7
Solid Waste and Pollution Prevention Branch
726 Minnesota Ave
Kansas City, KS 66101
Phone: (913) 551-7000

Other Help Lines

CHEMTREC (Information on chemicals and chemical spills. Operated by the Chemical Manufacturers Association.)
(800) 262-8200

Emergency Planning & Community Right-to-Know
(800) 535-0202

EPA's Superfund/RCRA Hotline (information on solid waste, hazardous waste and Superfund)
(800) 424-9346

OSHA (800) 32-6742

Pollution Prevention Clearinghouse
(202) 260-1023

Recycling Hotline
(800) 947-3873

Small Business Administration
(800) 827-5722

**Environmental Emergencies/Spill Hotline
call DNR at (573) 634-2436
(24-hour hotline)**

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Missouri Department of Natural Resources
Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102-0176*